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**IN PREPARATION
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Hygienic and Sanative Measures for Chronic Inflammation of the Nose, Throat and ear.

Special Hygiene for Pruritic Rhinitis (Hay Fever) and Asthma. (12mo. about 50 pages.)

The Physical and Mental Effects of Tobacco (12mo. about 30 pages).

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THE

Hygiene of the Voice,

With Twenty-Seven Illustrations.

BY

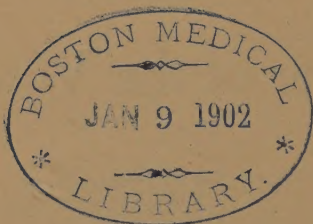
THOS. F. RUMBOLD, M. D.

Member of the St. Louis Medical Society; Permanent Member of the American Medical Association, etc., etc.

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PREFACE.

Having had a long and large experience in the medical care of Singers and Speakers, I have made their health, the stability and purity of their voices, and the diseases that affect their upper respiratory and vocal organs an earnest study. The result of this experience and study, so far as the Hygiene of the Voice is concerned, is here given for their benefit. No medical treatment is recommended, except a few simple remedies for temporary relief, and those only of such character as would not, under any circumstances, be harmful, however taken. The so called remedies, such as cocaine, chlorate of potash, and those of a similar character, are in no sense remedies, but always harmful in their effects, and their general use can not be too strongly condemned. My long experience teaches me that none but medical men should attempt the treatment of voice-users. It is not an exercise of common sense to think that non-medical voice-users, or their teachers, can employ medical prescriptions, however circumstantially given, nearly as successfully as can a physician. Not only this, but no one but a specialist, one who has limited his practice to the diseases of the nose, throat and ears, should treat

these diseases. If it requires—as it does—this man's utmost skill, aided by large experience, to relieve these complaints, how can it be expected that the physician who has not paid especial attention to these diseases, much less the non-medical man, will be successful, except by mere chance, and voice-users should not risk such a chance. Consequently, whenever an ailment requires medical aid, instead of giving a prescription, I have, in kindness to the voice-users, recommended that they consult a physician who has made these complaints a study.

In order to be certain of being clearly understood, the recommendations in regard to the hygienic care of the organs of the voice are given in as plain language as possible, but distinctness requires that quite a number of technical terms should be employed. These terms should be in general use, their employment is the best way to be rid of ambiguity when speaking of these organs and their complaints. A glossary is given for the definition of the more uncommon terms.

I have described the functions of the soft palate, uvula* and azygos prominence, for two reasons. One because it is well that Singers and Speakers should be acquainted with the functions that these three organs perform in the formation of the voice.

* See the Glossary for the definition of terms not understood.

“The study of vocal physiology is surely a very essential duty of the singing-teacher; without it he cannot conscientiously be a vocal teacher. Would you trust a physician whom you knew had not acquired the necessary knowledge of the mysteries of the human body? Why, then, would you pin your faith upon a voice-trainer who makes a boast of his ignorance of the natural laws that govern the vocal organs? * * * The knowledge of the vocal organs is always very useful to the singer, and especially to the teacher, and in many cases indispensable.”**

This leads to the second reason, namely: With a knowledge of these functions, the remedy to be employed to correct a defect of the voice suggests itself to the reader, whether it be physical training, or medical or surgical relief. There are many Singers and Speakers who have a partially paralyzed soft palate, or a hyperplastic uvula, or a debilitated azygos prominence, or with growths on the tonsils, or septum nasi, or nasal turbinates, whose voices could be greatly improved, were it known which one or more of these organs is in an abnormal condition. The symptoms accompanying these abnormal conditions are plainly given to the reader.

That which is here given in regard to the func-

** Leo Kofler, from Browne and Benke on Voice, Song and Speech, pp. 5 and 6, 1884

tions of the soft palate, uvula and azygos prominence is the result of original investigations and experiments commenced more than twenty-seven years ago, and published in the first and second editions of my works on the Medical and Surgical Treatment of the Diseases of the Nose, Throat and Ears. While somewhat lengthy, yet these investigations will repay careful study, because by far the most of the mechanical defects in singing and speaking are owing solely to abnormal conditions of one or more of these voice controlling organs.

There are many very good voices even in small cities that are slowly, but surely, being lost, solely because of ignorance of the laws of Vocal Hygiene. Obedience to these laws alone, without medical aid, might have saved them.

It will be noticed that no recommendations are given as to the methods of using the voice in speaking or singing, or as to the methods of breathing. Advice in these respects is left very properly, according to the Author's views, to the teachers of singing and speaking. Medical advice on vocal hygiene, such as a physician only can and should give, has been given.

T. F. R.

St. Louis, September, 1898.

Century Building.

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THE HYGIENE OF THE VOICE.

In this monograph on Vocal Hygiene, from a medical standpoint, only those precepts and recommendations will be given that relate especially to the organs required in the immediate production and modification of the voice in singing and speaking.

Named in the order in which these organs are most frequently affected by disability or disease, and in which the greatest care will have to be taken to preserve them in condition for the greatest usefulness, they are: The nasal passages; the pharyngo-nasal cavity;* the pharynx; the soft palate, uvula and azygos prominence; the tonsils; the epiglottis; the larynx; the arytenoid processes and vocal cords; the ears and Eustachian tubes; the tongue; the lips; the teeth and gums; the lungs, and the diaphragm. If the voice is not in its normal condition, it indicates that there is disease of one or more of these organs, unless it be due to a general debility of the whole system.

In order intelligently to impart information regarding the maintenance of these organs in a

*See Glossary.

healthy condition, a few remarks on some of their physiological actions, and on some of their most common pathological conditions, must be made.

These will also show, by contrast, how much certain sensations, as a slight dryness, or slight excess of secretion in the throat, etc., deviate from the normal conditions. There are many persons who mistakenly regard the sensations of dryness, etc., that plainly indicate a diseased condition, as a matter of so small import as to require no attention, or even hardly mention.

THE NASAL PASSAGES.

The Normal Quantity of Mucus.

These passages to the respiratory organs are lined with mucous membrane, one of the functions of which is to secrete mucus; another, to heat the air that passes to the lungs. The purposes of the mucus are to maintain the membrane in a moistened condition, so that it can properly perform the offices required of it, and to moisten the air as it is inhaled into the lungs. It is exceedingly important that these functions should be maintained at their normal equilibrium, else the voice suffers.

Healthy mucous membrane, wherever found, has on its surface only that quantity of mucus that will maintain it in a moistened condition; consequently,

when there is so much secretion that it flows, it indicates that the membrane is in an irritated condition, thus causing a greater quantity of mucus to be secreted than is normally required.*

Inflammatory conditions are always the result of irritation, occasioned primarily by colds manifested in the nasal passages, and by tobacco and stimulants, consequently, no person, as already stated, having healthy nasal passages ever blows mucus from his nose or draws nasal secretion down into his throat, or clears his throat. Every person who performs these acts has a more or less inflammation of the mucous membrane of these organs, or, to employ a medical term, has a naso-mucositis.

Impeded Nasal Respiration.

The nasal passages should have free breathing space, sufficient for full and easy respiration, on all

*This condition of the mucous membrane is known as "catarrhal," a word that means "flowing, or running down." The word 'catarrh' frequently tends to a misunderstanding of the condition of the diseased parts. For instance, when the inflammation is excessive, the heat of the surface is so great that it causes evaporation of the fluid portion of the secretion, consequently there is no flow, or, to use the other word, no catarrh, which is plainly contradictory, therefore, misleading. Many persons who experience a dry condition of the nasal passages and throat, and have no flow of the secretion, term their complaint a "dry catarrh," as though one could have a dry "flow." If the words naso-mucositis inflammation, or an equivalent term, is employed instead, there will be no confusion. Naso-mucositis is the proper term; this informs one of the location of the disease and of its character.

occasions, except when running or quickly ascending a pair of stairs of about twenty or thirty steps.

If, when lying in bed on one side of the body, the lower nasal passages become partially or wholly closed, it indicates a thickening of the mucous membrane. This thickening may be due to swellings occasioned by a recent cold, or a permanent enlargement, known as hyperplasia of the nasal turbinates—due to a long-continued or chronic inflammation of these parts. This condition is the result of having taken a great many colds, and of allowing them to “pass away of themselves,” which shows the importance of avoiding colds, and of being quickly cured of their effects; for it is only while colds are gradually “passing away” that the chronic inflammation—always a painless, sensationless disease—is slowly but surely forming, producing many sequences that are difficult to remove. The hyperplasias, or enlargements, must be removed by surgical means, or they will aggravate the inflammation that formed them, and result in permanent injury to the voice.

How Nasal Growths Increase Nasal Disease.

It is not at all difficult to see how these enlargements or growths in the nasal passages aggravate the inflammation that formed them. The avenue through each nasal passage is just sufficient—no

more, no less—in capacity, to allow the proper amount of air to enter the lungs during normal exertion or action of the body. When the nasal passages are normal in capacity there is, on taking in the breath, a slight rarefaction of the air in the whole respiratory tract. This is normal and is required for the purposes of nature. During expiration, the air in the whole respiratory tract is normally in a slightly compressed condition, which is required for the purposes of nature. Now, if one, or especially if both, of the nasal avenues are reduced in capacity by a growth or growths, the air in passing through the narrowed nasal passages will require greater exertion of the inspiratory muscles to draw it in, and greater exertion of the expiratory muscles to expel it. Consequently, the indrawn breath will cause a much greater air exhaustion in the whole of the respiratory tract than is normal, but as the nasal cavities are the only parts affected with chronic inflammation, the air-exhaustion has, by reason of this air pump action of the in-drawn breath, an irritating effect on these parts, and causes a still greater congestion of blood in the mucous membrane lining them. This increase of congestion means an increased blood supply in the inflamed parts, and this extra quantity of blood means increased size of the growth or growths, plainly

showing that the inflammation causes the growths, and the growths, in this mechanical way, increase the inflammation.

This is not all the injury done by the nasal growths. On forcing the air from the lungs during expiration, the nasal growths decrease the opportunity for the air to escape, thus causing excess of air compression in the whole respiratory tract, which has an injurious effect on all weakened mucous membrane by driving the blood from it. It is thus seen that during the indrawing of the breath the blood is drawn with undue force into the mucous membrane, and during the expelling of the breath the blood is unduly driven away from it. **This excessive contrast of the blood-pressure or blood supply in the inflamed parts maintains disease as long as the nasal growths exist.**

Mouth Breathing.

Breathing through the mouth is an acquired habit, but the habit originated from a necessity, namely, decreased space in the nasal passages. It is always the result of a limitation of breathing space in the nasal passages, caused by a swelling of the mucous membrane lining them, or by a growth. The effect of mouth-breathing is injurious to the throat, larynx, lungs and the nasal passages themselves, as

the latter require air to pass through them to maintain them in a healthy condition. If the nostrils were closed and maintained so for a month, I am sure that every portion of both passages would soon become in a highly inflamed condition, and this inflammation would soon extend, by continuity of structure, to the ethmoidal and sphenoidal cells, and the frontal sinuses, to the Eustachian tubes and middle ears. Some authors say that mouth-breathing has an injurious effect on the mentality of the sufferer. This is an erroneous way of stating it. If they said that the disease that caused the mouth-breathing injured the sufferer mentally, then the statement would be correct. The mental injury is due to the nasal inflammation extending to the brain by way of the blood vessels and nerves of the anterior and posterior ethmoidal cells, the frontal sinuses and the sphenoidal cavities.

The Cause of Some Mind Troubles.

Unlike any other part of the body, the nasal passages and these cells and sinuses opening into them are supplied by blood vessels from the brain cavity.

These blood vessels, after coming from the brain to be distributed to the nasal passages and the cells connected with them, send branches up into the brain cavity to the meninges, and branches from

these again leave the brain cavity and again descend into the nasal passages. It is seen that the nasal passages and these cells and sinuses are fastened, as it were, to the meninges of the brain by these blood vessels. This is one of the reasons why a mere cold in the head will affect one mentally, making one's mind cloudy.

Pruritic Rhinitis (Hay Fever.)

Many persons are slightly afflicted with this disease, that is, they suffer from a slight itching of the nasal passages, followed by a few sneezes; the sneezing soon causes a full or stuffed sensation of the passages. The sooner this complaint is treated the better for the voice.

THE PHARYNGO-NASAL CAVITY.

Dropping in the Throat.

If one is conscious of the least dropping or flow of mucus from the posterior portion of the nasal cavities into the throat, it indicates the existence of a chronic inflammation of these parts, of sufficient gravity to require the aid of a physician, as nothing the sufferer can do for himself is likely to result in anything but positive injury, causing him to be more susceptible to colds.

Inflammation that Affects Phonation and Vocalization.

If a singer or speaker is in the habit of forcibly and suddenly drawing in his breath through his nostrils, with his lips closed, making a sound in the back part of his throat while doing so, thus drawing the post-nasal and pharyngo-nasal secretion down into his throat; or if he, with mouth closed, sends a gust of air from his lungs up behind the soft palate out through the nasal passages, thus throwing the excess of secretion, that is lodged behind the soft palate, up higher into the posterior nares, these acts plainly prove the existence of chronic naso-mucositic inflammation that will be certain to weaken the voice if allowed to remain, and not only this, but to affect the stomach also. For a sufficient quantity of this partially decomposed secretion is involuntarily and unconsciously swallowed both day and night, much to the detriment of the whole digestive system.

Adenoid Growths.

These are most frequently seen in persons under twenty years of age. They are a source of a continual flow of secretion down the back of the throat, and ultimately lead to a serious debility of the voice,

especially for singing, and frequently cause a hacking cough that debilitates the voice for both singing and speaking.

Fibroid Growths.

These are far more serious in consequences than adenoid growths.

THE PHARYNX.

Follicular Pharyngitis.

The posterior surface of the pharynx, as seen when the mouth is opened wide and the tongue depressed, should not be more heightened in color than the anterior surface of the soft palate. If the surface is rough, because of the presence of small, round elevations, which condition is called "follicular pharyngitis," it indicates a chronic pharyngo-nasal and nasal inflammation. If this inflammation is allowed to remain, the voice will ultimately become injuriously affected. No applications of iodine, nitrate of silver, nitric acid, or any other caustic, should be applied to these small elevations, as no remedy—and certainly none of the above irritants—can be applied to them that will cause their disappearance. No one is conscious of the presence of these elevations. They produce no injurious effect on respiration or deglutition. They are

entirely painless, and can only be made to disappear by treating the originating inflammation that exists in the posterior nares. If they are larger than twice the diameter of a pin-head they may have to be removed by mechanical means. They are growths quite similar to adenoid growths on the upper posterior wall of the pharyngo-nasal cavity.

A Gagging Cough.

If a singer or speaker has had a gagging cough for several months, he usually has a follicular pharyngitis also. The pharyngitis is a sequence of the irritation occasioned by the lodgment of mucopurulent secretion on the posterior wall of the pharyngo-nasal cavity, and the presence of this secretion is the occasion of a gagging cough. In this condition he will notice that the cough, and the roughness in the back part of his throat are both frequently greatly increased when his stomach is "out of order;" and his stomach will very frequently be "out of order" at such times as the mucopurulent secretion flows from the posterior nares into his throat, thence into the stomach, showing the very close relation between the stomach and these air passages. Very frequently, when the stomach is in good condition his cough and the appearance of his throat will be improved, but the abnormal con-

ditions of the pharyngo-nasal cavity and throat will not permanently recover under stomach treatment alone. Local applications will be required to relieve the local inflammation behind and above the soft palate, for this is the primary location of the irritation that causes the cough; this inflammation in turn being caused by naso-mucositis.

The Soft Palate, the Uvula and the Azygos Prominence.

The soft palate is a vocal valve, as well as one of the organs of deglutition. As a vocal valve its actions are varied, for the reason that it is not a single organ, but a composite one, consisting of three organs, namely: the *velum proper*, the *azygos prominence* and the *uvula*. Each of these organs has a function to perform in voice modification that is peculiar to itself. They always act in conjunction, and will here be discussed collectively.

Examination of these Organs through the Nasal Passages.

In the spring of 1870, I had a patient whose right nostril was large enough to admit the whole length of my little finger. It occurred to me that this was an excellent opportunity for studying the functions of the uvula by means of a glass reflector passed into this man's uncommonly large nasal passage.

I had the patient keep his nostril wide open with a bivalve nasal speculum. Through the passage thus widely dilated, I easily passed my hinged pharyngeal reflector back to the posterior wall of the pharyngo-nasal cavity, as seen in Fig. 1. On

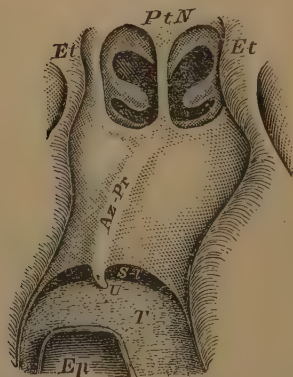
FIGURE 1.



Antero-posterior section of the head through nasal passages, showing the position of the mirror reflecting the upper surface of the soft palate, base of the tongue, epiglottis and vocal cords. E. t, mouth of the left Eustachian tube; R, reflector introduced through the left nostril; S, P, soft palate; U, uvula; Ep, epiglottis.

the reflector, I directed a very bright light—usually sunlight—illuminating the parts below the reflector so that they were distinctly seen. In this way I was enabled to inspect the upper or posterior surface of the soft palate, and the ridge on its central portion, that extends from its post-nasal septum down to the uvula, as shown in Fig. 2, Az. Pr.; a

FIGURE 2.



View of the posterior-nasal passages, the posterior surface of the soft palate, and the base of the tongue; Pt. n., posterior nares; E. t, Eustachian tubes; Az. pr., azygos prominence, on the upper surface of the soft palate, formed by the elevator palati and elevator uvula muscles; S.-l., semi-lunar openings formed by the tongue, uvula and soft palate; T., base of the tongue; Ep., epiglottis; U., uvula.

portion of the tongue, T; the epiglottis, Ep.; and the arytenoid processes and vocal cords, when the patient made a long “a” sound, as in “hay,” with his mouth closed.

My observations on this patient were repeated

from three to eight times daily for a period of five weeks. Subsequently, I made numerous observations of a similar character on many other patients.

After continuing these observations, as opportunities presented, for about seven years, I read the result in a paper before the St. Louis Medical Society in November, 1876.

In February, 1877, as I was dissecting (on a cadaver) the ridge that extends up and down the center of the posterior surface of the soft palate (Az. Pr. Fig. 2), I discovered that the muscles (called the *azygos uvulae* muscles in all works on anatomy) forming this ridge, were two pairs of muscles, an upper and a lower pair.

The upper pair, or, as I have named them, the **elevator palati muscles**, arise from the posterior nasal spine of the palate bone, and from the contiguous tendinous aponeurosis of the soft palate, and are inserted at about the junction of the lower third of the palate with the middle third, interlacing with the fibers of the lower pair of muscles. The lower pair, or, as I have named them, the **elevator uvulae muscles**, arise at the place of insertion of the elevator palati muscles—the fibers interlacing—pass downward and are inserted into the connecting tissue of the lower extremity of the uvula and form this organ.

These four muscles form the ridge on the back of the soft palate, mentioned above, and which is seen by means of a hinged reflector R, Fig. 1. This ridge I have named the **azygos prominence** shown in Fig. 2, Az. Pr.

The action of these two pairs of muscles can be plainly seen on inspection of the anterior surface of the soft palate, while the mouth is open and the tongue slightly depressed. On some persons the effects of the contraction of the elevator pallati are more marked than on others. Upon asking the subject to move the soft palate in various ways, after a number of efforts, a dimple on the under side of the palate, a little below the center, will be seen.

This dimple or indrawing of the lower surface of the soft palate indicates the location of the insertion of the elevator palati on the upper or posterior surface of the soft palate. It is seen to be about two-thirds of the way down the central line of the soft palate.

Some may say that this is the action of the elevator palati, but these muscles are inserted into the whole width of the soft palate, from the uvula to the nasal spine of the palate bone; so that their contraction could not, at any time, raise one spot so as to form a dimple on the under side of the soft palate. The dissecting knife plainly shows that

this is the case in respect both to the levator palati and elevator palate.

It will be seen that this action of the elevator palati has no effect upon the uvula. During the efforts of the patient to elevate and depress the soft palate, sometimes the uvula will become elevated, either with or ~~without~~ the dimple on the under side of the soft palate, showing that there are two distinct sets of muscles, one to elevate the soft palate and the other to elevate the uvula.

The contraction of these four muscles causes the azygos prominence (Az. pr., Fig 2) to become more noticeable. This prominence is required during the formation of certain semi-nasal and semi-oral sounds, as will be seen.

Movements of the Soft Palate, the Azygos Prominence and the Uvula, as Seen by Reflection Through Nasal Passages.

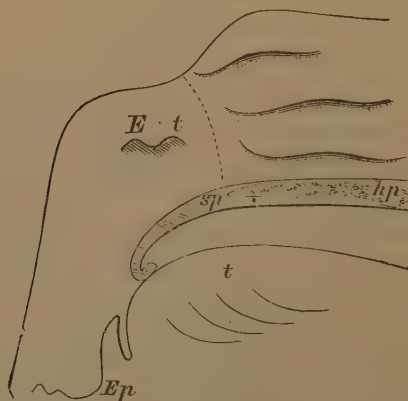
I will now describe in detail, my observations gathered, during the last twenty-seven years, from a large number of inspections of this part of the air passage, by means of a reflector passed into the back portion of the nasal cavity through the nasal passage.

During **mastication** the whole free border of the soft palate rested on the base of the tongue,

reaching within a short distance of the epiglottis, the palate slipping up and down continually on the base of the tongue. In no case is the uvula in sight at any time, excepting in patients with elongated (abnormal) uvulas. This organ seems to be doubled up under the soft palate, as shown in Fig. 3. When the uvula is in sight it almost invariably touches the epiglottis, but in no instance does the patient know it, as it does not occasion the least sensation.

During the act of deglutition the soft palate is pushed backward by the bolus of the food, until the posterior wall of the pharyngo-nasal cavity is

FIGURE 3.



Antero-posterior section of the hard palate (hp.) and the soft palate (sp.), showing the position of the uvula resting on the base of the tongue (t.); Ep., epiglottis; E. t., mouth of the left Eustachian tube.

reached, then the motion is continued in an upward direction, until the upper surface of the soft palate was high enough to close and cover both Eustachian tubes, suddenly pushing the reflector (R., Fig. 1) upward and forward.

When the instrument is not instantly removed, a severe gagging cough ensues, and this sometimes continues until actual vomiting is occasioned.* Immediately succeeding the closure and covering of the mouths of the Eustachian tubes, the larynx is raised up to the bolus of food, and the soft palate, food and larynx, all go down together. At the completion of the act of swallowing the food, the soft palate rests on the base of the tongue. It is at this period that the uvula is seen touching the epiglottis, but it is only observed to occur, as I have said, in patients who have elongated uvulas, this organ being in each case fully three-fourths of an inch in length.

I have seen these motions repeated several hundred times, and whether with food or water, the tongue and soft palate invariably went through the same motions. It is seen that the uvula has no part to perform with the act of mastication or de-

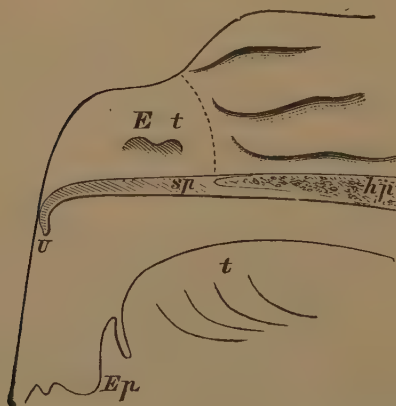
*This positively demonstrates that the surface of the pharyngo-nasal cavity touched by the reflector is the place of lodgment of the tenacious secretion that causes the "gagging spells" that afflict many persons in the morning.

glutition, as asserted by quite a number of authorities.

During the vocalization of sounds that pass through the nose alone, the whole free border of the soft palate rests on the base of the tongue, as diagramed in Fig. 3, the uvula not being in sight.

During the vocalization of sounds that pass through the mouth alone as in the phonation of long "a," made continuously and without effort, the soft palate is raised and a small portion of its lower border is pressed against the posterior wall of the pharynx, as diagramed in Fig. 4.

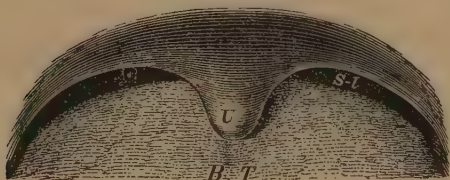
FIGURE 4.



Antero-posterior section of the hard palate (hp.) and the soft palate (sp.) showing the position of the velum closing the avenue to the pharyngo-nasal cavity. U, uvula; t, tongue; Ep., epiglottis.

During the vocalization of sounds that pass through the **mouth and nose at the same time**, the soft palate is either so suspended that but a small part of the central portion and the uvula rest on the base of the tongue, as shown in Fig. 5, or it is so raised upward and backward that the azygos prominence touches the posterior wall of the pharynx, as shown by reflection upon the hinged pharyngeal

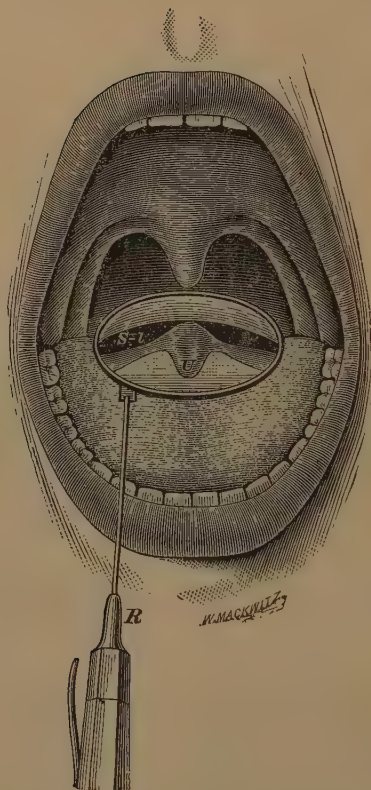
FIGURE 5.



View of the anterior surface of the soft palate, the uvula and the base of the tongue, showing the lower semi-lunar shaped openings (S-l.) formed by the uvula (U.) and a part of the central portion of the velum resting on the base of the tongue. (B. t.)

mirror, in Fig. 6. In both of these positions the passage between the fauces and the mouth, and that between the fauces and the pharyngo-nasal cavity is divided into two equal or nearly equal semi-lunar openings.

FIGURE 6.



The image seen on the hinged reflector (R.) of the lower surface of the soft palate, and the lower or posterior concave surface of the uvula (U.), showing, also, the higher semi-lunar shaped openings (S-l.) made by the azygos prominence touching the posterior wall of the pharynx.

In the first position named the division is made by the uvula and a small part of the central portion of the velum resting on the base of the tongue, as shown in Fig. 5, S-1.; and in the second position, the partition is made by the azygos prominence, as shown by reflection in Fig. 6, S-1., touching the posterior wall of the pharynx. In one patient I noticed, several times, that the uvula seemed to be resting on the base of the tongue, while at the same time the azygos prominence was touching the posterior wall of the pharynx. In this position the sound passed through the mouth and nasal passages at the same time.

When I began to make these observations, I directed my attention to the uvula alone; but the varying height of the azygos prominence during vocalization of various sounds drew my attention to it, and what I then discovered was confirmed in subsequent examinations, namely: that this prominence, which I had known to exist for some time, was of equal, if not of more importance in vocalization than the uvula itself; so that, while endeavoring to ascertain the functions of the uvula, I discovered a new organ—the azygos prominence—and also ascertained its functions at the same time.

It was repeatedly observed that the free border of the soft palate at no time hung unsupported in

the current of air that came from the larynx during vocalization; at such times it was always in such positions as to receive support from the uvula or the azygos prominence, or both, which support prevented it from being thrown into vibration by the air that came from the lungs.

It is well known that a substance that may be easily thrown into vibrations will vibrate, if suspended in the neighborhood of a vibrating body, and especially if the air that produces the vibrations also strikes the suspended substance.

This is the condition of the soft palate when suspended over the vibrating vocal cords, and it would certainly vibrate in unison with the cords, were there not some means to prevent it, and these means are the azygos prominence and the uvula, shown in Figs. 5 and 6.

I will mention again the principal positions that this vocal valve, the soft palate, assumes during varied forms of vocalization. For the formation of sounds that pass through the mouth alone, it is elevated and pressed against the posterior wall of the pharynx, as shown in Fig. 4. For the formation of sounds that pass mostly through the mouth and a little through the pharyngo-nasal cavity, it is removed a short distance from the posterior pharyngeal surface, but not so far as to prevent the azygos

prominence from touching the wall, as shown in Fig. 6. For sounds that pass mostly through the nose and a little through the mouth, it is lowered to allow the uvula and a small part of the central portion of the soft palate to rest on the base of the tongue, as shown in Fig. 5. For the formation of sounds that pass through the nose alone, it is lowered still more, so that the whole free border of the soft palate rests on the base of the tongue, as shown in Fig. 3. In a few instances, as has been mentioned, I have seen the uvula resting on the base of the tongue and the azygos prominence touching the posterior wall of the pharynx at the same time.

The peculiar formation of the inferior or posterior surface of the uvula, seen in Fig. 5, U, as well as the peculiar position it assumes as it hangs from the velum, that is, its lower extremity pointing outward, indicates that the lower surface lies on the base of the tongue almost all the time. It is evident that this is the best position in which it could be placed to prevent the free edge of the soft palate from being shaken by the force of the air from the larynx.

These observations demonstrate that one of the functions of the soft palate is to act as a vocal valve. It directs or conducts the sound from the larynx

into the mouth alone for the formation of one kind of sound; into the nose alone for another kind, and divides the sound so as to allow it to escape from both of these openings, for still others. It is evident that while the velum is resting wholly on the base of the tongue, or while its whole free border is pressed against the posterior wall of the pharynx, the liability of its free border to vibrate by the force of the air from the larynx is reduced to a minimum. But when it is in either position that requires it to divide the sound between the mouth and the nose, then, on account of its free edge being suspended and placed immediately in the current of air from the larynx, its liability to vibrate is increased to a maximum. Under these circumstances it is seen that there is a necessity for a provision to prevent these vibrations. This provision, I am led to believe from my observations, is found in the uvula and the azygos prominence—the latter formed by the contraction of the elevators palati and uvulæ muscles. These muscles are located in the center of this very mobile palate or valve, and by their support, in both positions that require suspension (Figs. 4 and 5), prevent it from being shaken by the force of the current of air from the lungs. There can be no doubt that if there were no uvula or azygos prominence to prevent this thin edge of sus-

pendent flesh from vibrating, it would be shaken to such a degree as to impart a tremulous tone to all sounds forcibly uttered, that pass through the mouth and nose at the same time.

Excisions of the Uvula.

The following questions have been frequently asked :

First, "If the uvula is required to prevent the free border of the velum from vibrating during phonation, will not its loss impair the tone of the voice?"

Second. "How do you account for the improvement of the voice in many instances, after the removal of the uvula?"

In answer to the first question I would say:

The loss of the uvula will impair only those tones that are formed at such times as the soft palate requires support to prevent it from vibrating, its vibrations causing the impairment. In the case of the loss of the uvula, if a sufficient portion of the central part of the soft palate rests on the base of the tongue, so as to form a slight support of the palate, then tones made with but slight lung exertion may be unimpaired, but all tones made by a strong exertion will be very imperfect. As excisions, as usually made, leave a stump of the uvula, this and the central portion of the soft palate will prevent any vibration during sounds made with the

usual force of the lungs. There are, however, many tones made during usual singing and speaking, that with a loss of a very small portion of the uvula could not be made perfectly.

The loss of the uvula does not interfere with the formation of the two semi-lunar shaped openings formed by the borders of the velum and the dorsum of the tongue, which allow the voice to escape from the mouth, and thus provide for perfect vocalization. This loss takes away only a part of the support of the soft palate, but if the soft palate suffers so much loss of substance in its central portion that its concavity is equal to the convexity of the dorsum of the tongue, thus preventing the formation of the lower semi-lunar shaped openings (shown in Fig. 5), and removing all support of the lower, free edge of the velum, then there will be some sounds—such as pass mostly through the pharyngo-nasal cavity, and a little through the mouth—given imperfectly, in spite of all efforts to overcome the disability. This is because the proper tone requires that the velum shall be raised to allow a part of the sound to pass to the mouth, and the act of elevation exposes it—the now unsupported velum—to the force of the air from the larynx, which will cause its unsupported edge to vibrate, producing imperfect sounds.

Again, if the loss in the center of the velum be

greater than can be closed by the greater convexity of the dorsum of the tongue, the disability will be equal to that caused by a perforation of the soft palate, and in addition, there will be a tremulousness of many semi-nasal tones, when loudly spoken as in addressing a person at a distance. That the intermittent tone is occasioned by the vibration of the central portion of the velum, is evident from the pain or weariness experienced in this part after speaking at great length in a loud voice. This pain was experienced by two patients while under my care, whose soft palates are notched to this extent by ulceration. I had a patient in 1898, a lawyer, who suffers from a similar disability.

In answer to the second question, "How do you account for the improvement of the voice after removal of the uvula?" I would ask: Is it claimed that this improved vocalization is equal to the patient's vocalization at the time that his uvula was in a healthy condition? That a relative improvement in voice does follow an incision of an elongated or hyperplastic uvula, there can be no doubt, because this operation brings the organ nearer to its normal size and condition. But it resembles the improvement made by perforating the membrana tympani in a case of deafness, caused by a partial closure of the Eustachian tube, or the removal of a catarac-

tous lense from an eye. An organ so improved can never equal the organ in its normal condition. The operation on the uvula will leave a stump which will not be a hindrance to every word, but a cause of inability to pronounce some words on forced vocalization only; and even this will be overcome in time by the dorsum of the tongue becoming sufficiently convex.

Therefore, to admit that the removal of a diseased uvula may improve the tone of voice, does not prove that it was alone the uvula's removal that was the cause of the improvement, for, if such were the case, the excision of the healthy uvula would be not only advisable, but desirable.

The effect of the amputation of the whole of the uvula, besides its being a loss of the greater part of the support of the velum, will prevent the formation of the lower part of the azygos prominence from attaining its greatest height, which is done by the contraction of the elevator uvulae muscles. This height of the prominence is required to prevent, by its contact with the posterior wall of the pharynx, the vibrations of the velum during the formation of many semi-nasal sounds.

The nearer the surgeon can make the diseased uvula take the shape and size of the normal one, the nearer will it approach its normal functions;

that is, to render the soft palate a non-vibratory valve, which is required for perfect phonation.

Paresis of the Uvula.

If this organ is not under control, the voice will be more or less imperfect, even if the voice-user does not know it. Let a person stand before a window, open his mouth and inspect his uvula, aided by a small hand mirror; if he sees that the uvula moves freely up and down, that is, contracts and relaxes itself, then it is in a normal condition; but if he cannot cause it to move, that is, to contract, then it is debilitated, and this debility is due to inflammation in the pharyngo-nasal cavity, which has extended to the soft palate and uvula.

Paresis of the Azygos Prominence.

One not a physician, or one not acquainted with the method of examination of the throat, cannot determine the question of the paresis of this organ. It requires the aid of the throat mirror, and the application of a very gentle current of induced electricity. If the prominence is increased in height by a very slight current, it indicates a healthy condition, if not, an unhealthy condition.

THE TONSILS.

Tonsil-Growths.

Growths on these glands come next in being most frequently an impediment to voice-users. When the tonsils are in a healthy condition they are not in sight, consequently if there is any substance seen protruding on either side at the base of the tongue, it is a tonsil-growth. Of course the enlargement may be merely swelling of a healthy tonsil, or it may be a permanent enlargement. In the latter case the growth may be called a tonsiloid,* that is, an enlargement like a tonsil. In this condition the name enlarged tonsil, or the medical term hypertrophy, is improperly given. The blacksmith's arm is hypertrophied, because it is increased in size and function while the diseased growth on the tonsil has no function. If one or both tonsils have become suddenly swollen, then it may be possible to reduce the inflammation, but if the enlargements have been slowly coming on, and have been maintained for a year or more, then it is altogether likely that an operation by excision will be required to remove the growths, the tonsilloids. In this operation the tonsils are not excised, only the growths upon them are removed

*Tonsil, and "eidos, resemblance.". Resembling a tonsil.

These chronic enlargements are not glandular structures; they resemble glands; but they are warty substances. They throw off an abnormal secretion only.

After an Excision of a Tonsil-Growth.

Great care should be taken to prevent taking cold until the wound heals. If the patient is in a feeble condition the operation should be performed at his residence. If performed at a physician's office, a piece of cotton should be warmed and put into his ear on the side of the operation. The neck should be wrapped and the mouth kept closed. A little warm vaseline rubbed on the neck and around the ears is a good protection. The first few meals after the operation should consist of soft food, as warm milk and bread, or oat or corn-meal porridge. As a general rule all discomfort from the operation disappears after three days at most, frequently after a few hours.

In almost every instance in which the tonsil-growths have been removed, and thorough treatment for the nasal inflammation has been given, the register of the voice for singing has been increased two and one-half notes, sometimes more. Not only this, but the singer will be able to take his notes with far greater certainty, and both speak-

ers and singers will be able to use their voices much longer and with greater ease, showing plainly that disease of these glands has a markedly injurious effect on the voice.

Especial Times for Vocal Rests.

If one has undergone an operation on the tonsils or in the larynx, either of which will temporarily weaken the vocal cords, the voice should be rested until the wound has improved so much that there is no pain in the employment of the voice; then, but not until then, judicious exercise of these organs should be taken. Equally applicable is this advice to those who have taken a cold in the head, one that even slightly affects the vocal organs. As soon as the cold begins to improve, the use of the voice in singing or speaking should be commenced. This is the case also with those who are compelled to go to bed on account of sickness. As soon as convalescence has been established it will be well to begin vocal exercises, of course very gradually increasing the exercises in proportion to the degree of recovery.

Allowing the vocal organs to remain in undue idleness is as detrimental to them as is the prevention of motion to the recovery of a fractured arm, or the denying of exercise to a recovering patient.

In the incidents above mentioned, judicious exercise will almost always restore the debilitated vocal organs to their normal condition. But there are other incidents in the lives of some singers and speakers where rest cannot restore these organs to their normal state. The fractured arm of a man is never so strong as it was before the fracture. So it is with the voice; a broken voice is never as strong as it formerly was. When a man shouts his vocal cords into an inflamed condition, or a singer exerts himself so that his voice breaks, nothing will restore these organs to their normal condition. Yet by far the best that can be done for them is judicious rest and judicious exercise. Complete rest for several months will result in their almost permanent recovery.

THE EPIGLOTTIS.

The epiglottis is a cartilaginous covering to the glottis, or opening through the larynx into the windpipe or trachea. When food is swallowed or liquids are drunk, the epiglottis is made to cover the opening to the lungs by the larynx being lifted upward to it in the act of deglutition. In this way this little trap door prevents the food from entering the trachea and lungs.

Abnormal Curvature of the Epiglottis.

It is not an uncommon thing, in the examination of the throat of a large adult person, to see the curved portion of the epiglottis very much smaller than usual. After many years of close inquiry concerning the throat ailments of those upon whom these unusually small curves are seen, I have come to the conclusion that this condition of the epiglottis is the result of diseased action during the younger years of the subject's life.

If, during the examination of a throat, I see an epiglottis having the curve of its upper free border similar in shape and size to that of an infant, I ask: "Did you have a very sore throat when you were very young?" naming about the year indicated by the shape of the epiglottis. If the curve is very small, he may say, "No, I think not, of course I cannot recollect it, but I think I would have heard of it, if I had." "Please ask some of your relatives, those who are older than yourself concerning this." In the very great majority of instances the information comes back that he did have this very sore throat at the time indicated by the shape and size of the upper border of the epiglottis. When the line of the abnormal curvature of the epiglottis is somewhat flatter than this, the subject may have

been at such an age that he can recollect the occurrence of the attack of severe sore throat. Whenever, since 1886, I have seen an epiglottis of an adult similar in shape and size to that of an infant or a child or a youth, I have always asked questions similar to the above, and the answers have been so uniformly as indicated, that I feel pretty sure that further investigation will prove I am correct.

From what I can gather from my patients objective and subjective symptoms, it appears that if a part of the epiglottis, especially its upper free border, becomes slightly inflamed, its growth may not be interfered with, or the interference may be so slight as not to be noticeable. If, however, this inflammation is very severe—but not severe enough to induce ulceration—then the part thus diseased will not continue to increase in size *pari passu* with the other organs of the body; in other words, its growth may be very much slower, or it may cease to grow and remain in an atrophied condition, according to the degree of severity of the inflammation, plainly showing that diseased action has a controlling effect upon its growth. If an epiglottis of this kind is examined by the aid of the microscope it will be seen that almost all the glands on

the posterior surface are in an atrophied condition. "The smaller the curved portion of the epiglottis, the younger was the patient when the inflammation occurred."*

Why is this Abnormal Curve Maintained through Life.

The inflammation has been severe enough to seriously affect the lining membrane of the epiglottis, the perichondrium, so that many of its blood vessels have been either atrophied or obliterated, thus preventing its normal nutrition, its full growth, but leaving enough vessels to maintain life in the part.

The Normal Epiglottis of an Infant, to the Third Year of Age.

The normal curvatures of the epiglottis of an infant (up to the third year of age) is about equal

FIGURE 7.

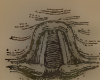


FIGURE 8.



Figure 7. The normal curvature of the epiglottis of an infant two years old.

Figure 8. Two circles, one three-sixteenths, another one-quarter of an inch in diameter, that are about equal to the curved portion of an infant's epiglottis, up to the third year of age.

*Treatise on the "Nose, Throat and Ears," Rumbold, page 181, 1888.

to a segment of a circle of from three-sixteenths to one-quarter of an inch in diameter, as shown in figures 7 and 8. If an infant of this age has a very severe inflammation of the throat, so as to involve the epiglottis, this organ may be so affected that the line of curvature its upper free border then has, will be the one it will have for the remainder of its life; that is, the portion that is curved will not increase in due proportion with the other parts of the throat, but continue in the line of curvature that existed at the time of the severe sore throat. Of course I cannot say positively that this curvature will not, in time, approach more nearly to a straight line, but the age, generally given when the throat ailment occurred, and the outline of the curvature correspond so nearly, that but little or no growth seems to have taken place after the severe inflammation occurred.

Figures 9 and 10 show the outline of the epiglottis of a man five feet ten inches in height, who had a diphtheritic sore throat during the second year of his age. It is seen that it was the free upper border that was the most affected part of the organ. This subject is now 27 years old; he has no disability in the throat of any kind, but he has a tenor voice in speaking and singing. It is my opinion that this

tall man's high pitch of voice is the result of severe inflammation of the larynx that occurred during

FIGURE 9.

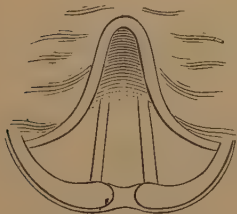


FIGURE 10.



Figure 9. The outline of an epiglottis that was inflamed during the second year of the subject's life.

Figure 10. An outline of an antero-posterior vertical section of the epiglottis as outlined in figure 9.

his childhood—at the same time his epiglottis was inflamed—and that this disease prevented its full growth, that is, slowed its growth, consequently the vocal cords are shorter than usual, hence the higher pitch of the voice than usual for a man of his stature.

The Normal Epiglottis of a Child, Aged from Three to Ten Years.

The normal curvature of the epiglottis of the middle age of childhood (from the third to the tenth year of age) is about equal to the segment of a circle of three-eighths to one-half of an inch in diameter, as shown in figures 11 and 12. If a child suffers from a severe throat ailment, and the epi-

glottis is also affected severely, the shape of its upper free border may become permanently fixed at this curve during the remainder of the patient's life. In some cases growth is observed in the extension of the two sides from the curved portion backward, so that if the free border is made to take the normal curvature, it will measure about as much in extent as a normal epiglottis, as shown in figure

FIGURE 11.

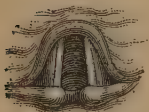


FIGURE 12.

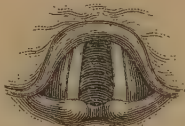


FIGURE 13.



Figure 11. The normal curvature of the epiglottis of a medium sized boy, five years of age.

Figure 12. The normal curvature of the epiglottis of a large boy, seven years old.

Figure 13. Two circles, one three-eighths, the other one-half of an inch in diameter, that are about equal to the curvature of a child's epiglottis.

14. In this case the abnormality seems to be in the curved portion only of the upper free border,

FIGURE 14.

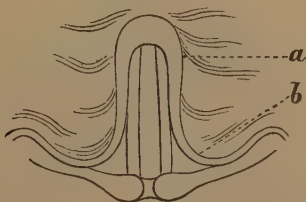


Figure 14. Outline of an abnormal epiglottis of a man thirty-seven years old. The two sides of the epiglottis from a to b being apparently unaffected by the inflammation that made the curved portion permanent.

leaving the two sides unaffected, as is shown by their continuing to grow.

Sometimes there is no extension of the two sides from the curve, the growth being in the vertical direction, and in the base of the organ, as shown in figure 14. I have, at present, a patient under my care whose epiglottis shows that almost no growth of any portion of it has taken place, since the time she was a girl but eight years old. At this age she had a very severe attack of diphtheria or ulceration of the throat. The curvature of her epiglottis plainly indicates that this was the age of the severe attack. Although she is now nearly forty years of age, her epiglottis is so small that when her throat and pharyngo-nasal cavity is inflamed, even to a slight degree, she has, during the whole time of this inflammation, great difficulty in swallowing her

FIGURE 15.



Figure 15. Outline showing arrested growth of an epiglottis.

food, and many times even with the greatest care, some will pass into the larynx. She is a tall woman.

an, consequently her larynx—which was unaffected by disease—has outgrown the ability of the little epiglottis to cover it. Figure 15 shows an outline of her small epiglottis and long glottis that must be covered at each act of deglutition or a choking spell will surely ensue. It is seen that her organs for a good singing voice—long vocal cords—are excellent. She has a powerful voice and great range.

The Normal Epiglottis of a Youth Ten to Twenty Years of Age.

The normal curvature of the epiglottis at about the middle age of youthhood (from the tenth to the twentieth year of age) is about equal to the segment of a circle about five-eighths to three-quarters of an inch in diameter, as shown in figures 16, 17 and 18.

FIGURE 16.

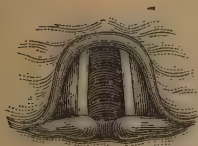


FIGURE 17.

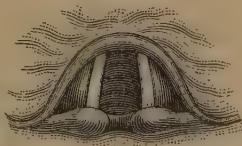


FIGURE 18.



Figure 16. The normal curvature of the epiglottis of a girl twelve years of age.

Figure 17. The normal curvature of the epiglottis of a boy nineteen years of age.

Figure 18. Two circles, one five-eighths, the other three-quarters of an inch in diameter, that are about equal to the curvature of a youth's epiglottis.

The large number of adults having epiglottises of this size, and the ample opportunity for knowing whether or not these persons had severe sore throats during their youthful years, makes it an easy matter to ascertain the facts in each case concerning a sore throat during these years. It was the study of cases of this age especially that resulted in the formulation of the theory presented here.

Mrs. G., aged 47 years, presented an epiglottis as shown in figure 19. When I first saw her throat

FIGURE 19.



Figure 19. The outline of the epiglottis of Mrs. G., aged 47 years.

I said to her that she had suffered from a very sore throat when she was about thirteen years of age. She recollected the illness very well. In a few days she brought me her daughter, who was ten years old, and asked me to examine her throat. I did so, and found that she also had had a very sore throat when she was an infant; which was true. Mrs. G. brought her solely as a test of my theory.

The Voice Sometimes Permanently Affected by Inflammation of the Throat.

It would seem as though when the epiglottis was so seriously inflamed that its further growth was retarded or prevented and an abnormal shape was given to it, that both the shape and the disease would have a serious effect on the voice; but such is not always the case. The voice comes from the vocal cords; if these are short, the voice will be high in pitch, if long, then low in pitch. The epiglottis may be seriously inflamed without affecting the larynx, but if this severe inflammation should have included the larynx, so as to prevent, or even retard its growth in due proportion to the size of the individual, then the voice would retain the pitch that the patient had when the severe inflammation occurred. Consequently, an abnormally shaped epiglottis alone can have but little effect on the voice unless the larynx also was so much diseased as to cause the arrest of its growth.

Mr. R., aged thirty-three years, presented an epiglottis, as shown outlined in figure 20. He had a severe sore throat when he was sixteen years old. At this age he had a good singing voice, which was not in the least injuriously affected, indicating that the larynx was not seriously affected.

FIGURE 20.



Figure 20. Outline of Mr. R.'s epiglottis.

Mr. J. B., a large man, age 57 years. He had a very sore throat when he was ten years old. An outline of his epiglottis is shown in figure 21. He has a good bass voice.

FIGURE 21.

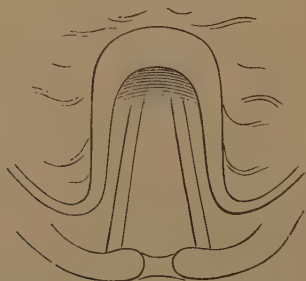


Figure 21. Outline of Mr. J. B.'s epiglottis.

Figure 22 shows a partially affected epiglottis of a small woman, age 20 years. She had a very sore throat when she was 18 years old. Her voice was

FIGURE 22.

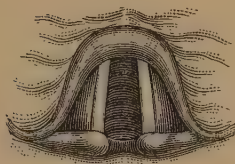


Figure 22. The epiglottis of a small woman.

changed to a marked degree upon her recovery. I think that the change is permanent.

Miss H., medium sized woman, age 25 years, presents, to all appearance, a normal epiglottis, as shown in figure 23. When she was 15 years old she had a very severe "sore throat." To "prevent her

FIGURE 23.

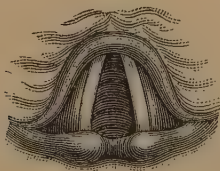


Figure 23. Miss H.'s epiglottis.

from choking," her physician performed tracheotomy. The effect of her sickness was the changing of her voice—that once was "quite a remarkable one"—so that it is now almost impossible for her to sing at all. She wore the tracheal tube but

two days, seemingly indicating that her change of voice was due to the disease of the larynx.

Chlorate of potash solution was used in the treatment of her throat ailment for two weeks, the disease increasing in severity during the whole time of its use. I have not the least hesitancy in saying that the potash was the agent that made tracheotomy essential to save her life.

The Normal Curvature of the Epiglottis of an Adult.

The curvature of the normal epiglottis of an adult varies considerably within certain limits. It is about equal to the segment of a circle of from one to one and a quarter inches in diameter, as shown in figures 23, 24, 25 and 26. Miss McF., aet., 22, presents a normal epiglottis, as shown in figure 23. She has at no time suffered a sore throat.

FIGURE 24.

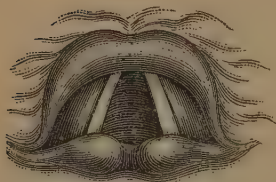


FIGURE 25.



Figure 24. Miss McF.'s normal epiglottis.

Figure 25. Circle of one inch in diameter.

Mr. G., a large man, aet., 54, presents a normal epiglottis, as shown in figure 26. Has at no time suffered a sore throat.

FIGURE 26.

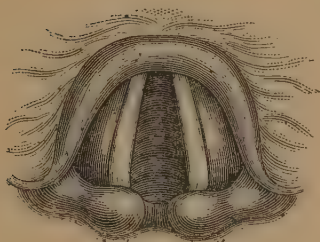


FIGURE 27.

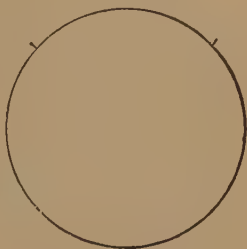


Figure 26. The normal epiglottis of Mr. G.

Figure 27. Circle of one and a quarter inches in diameter.

THE LARYNX AND VOCAL CORDS.

The larynx is the special organ of sound. It is at the upper end of the air passage of the lungs. It is a cartilaginous, funnel shaped tube, across which are stretched two bands, whose function is to vibrate, commonly called vocal cords. It is here that sound is made and partly modulated, but only as to pitch. The sound is produced by the expulsion of air from the lungs through the trachea and made to pass the vocal cords. These organs are not cords, the same as those seen on a string instrument, but ligamentous processes that are made to approach each other, so that when the air rushes past them they vibrate and emit sound. Speech is not made here, only sound. The organs that utilize the vocal vibrants, so as to produce speech,

are the tongue, the lips, the hard and soft palate, the teeth, the uvula and azygos prominence, and the nasal passages and their connecting cavities.

One end of each vocal cord—or vibrant—is attached to the front portion of the larynx, just inside of the Adam's apple; the other end of each is attached to one of the two arytenoid processes, each of which is pyramidal in shape. The action of these arytenoids on the vocal cords forms and closes the glottis. The arytenoids also tighten the vocal vibrants or cords when sound is made. If the muscles controlling these two little pyramids—the arytenoids—are in a healthy condition—the person being healthy—the sound is normal. When the whole system is exhausted, the action of the arytenoids is weakened, then the sound formed by the cords is weakened.

Abnormally Small Larynx.

It is not an uncommon thing to hear a young man's voice jump, unexpectedly, from his "boy-voice," to the voice he will use during his manhood. The change in the pitch of the voice is usually one octave. Now, if this young man at this age suffers from a serious inflammation of his throat, involving his larynx, the disease may be so severe as to check further growth of his larynx, so that his

voice will, during the remainder of his life, be apt to jump from one octave to the other at any moment while he is speaking. Such a person can, during his life, use the tenor voice of the boy or the bass voice of the man.

The Tenor Voice Due to Early Disease of the Larynx.

An instance of the retention of the young voice is given on page 56, and illustrated by figures 9 and 10. This indicates that the tenor voice in the tall adult man is the result of disease of the larynx while he was at a young age. In every instance in which I have examined the throat of a man with a tenor voice, I have seen many evidences of diseased action during the age of infancy, childhood, or that of the youth.

Laryngitis not Usually Idiopathic.

Primary affections of the larynx and vocal cords are extremely rare; especially is this so with those who cultivate their voices. Speaking or singing out of doors to a large company very often results in primary injury of the vocal cords, as the voice-user is not conscious of the excessive strain he is exerting on the laryngeal muscles.

Almost the only primary affections of the larynx

that I have seen have been brought on by the use of mops, brushes, probangs, gargles, etc., applying nitrate of silver and other astringents, and chlorate of potash, cubebs, camphor, carbolic acid, etc., to relieve a sensation in the throat that is always occasioned by inflammation of the pharyngo-nasal cavity. As the effects of these means and medications are mechanical injuries, time alone is an important element in the recovery from their effects.

Deceptive Throat Sensations.

Aside from the mechanical injuries mentioned above, vocal disability is not usually due to laryngeal inflammation *per se*. In nearly all vocal disabilities and even in recent aphonias (except in the case of those who have used tobacco for a number of years, their vocal cords always being inflamed), a view of the vocal cords by reflection will demonstrate that they are not in the least inflamed, and that their color is similar to that of the white of the eye—the normal color—but on attempting phonation, the cords act imperfectly, their edges do not approach each other as they should do—that is, they are not drawn tight enough—but it is not the fault of the larynx, but of the nerves that control the muscles of the vocal cords. These nerves have

been seriously impaired by inflammation located, not in the larynx, for this is seen to be in a comparatively healthy condition, but two and a half to six inches above the larynx, that is in the pharynx and pharyngo-nasal space. Here the mucous membrane is very greatly inflamed, and has been in this condition for many years. This is a very important fact, and is proved to be true by treating this inflamed surface alone. On the reduction of this pharyngo-nasal inflammation the vocal cords come properly together, and produce a more perfect sound. I have witnessed this many hundreds of times.

I again urge that this is a very important matter to singers and speakers. If, as is universally believed, their vocal disability is due to the laryngeal trouble alone, then the larynx alone should be treated. Now, if the larynx is not at fault, but is vigorously treated with nitrate of silver, iodine, carbolic acid, etc., what must be the result? The answer is—as has been demonstrated times without number—the patient is made far worse, if not permanently injured, confirming the assertions of almost every teacher of music and elocution, namely, that the majority of physicians do not know anything about such cases. Even a “do nothing”

course is far better than this harsh, irritating, unrelieving treatment—unrelieving because irritating.

CAUSES OF VOCAL DISABILITY.

The Soft Palate.

If the pharyngo-nasal cavity and pharynx are inflamed, the whole of the soft palate will partake of their condition, and there will be more or less vocal disability. With this disability comes imperfection, uncertainty and weariness of the voice. Debility of this portion of the throat is far more frequently concomitant with vocal imperfection and weariness than is inflammation of the vocal cords themselves. This is not popular teaching, but my experience with singers and speakers during the last thirty-five years sustains this conclusion. It is for this condition that many take what is usually called "throat tonics," "throat comforts," etc.

Abnormal Uvula.

If this organ is too long, too large or too small, the voice will not be perfect. A uvula that is too small cannot be remedied; but one that is too long or too large may be made to assume more nearly the normal condition.

Hot and Cold Drinks.

Unless sipped they are injurious to the mucous membrane. A glass of ice water followed by a cup of hot coffee, or vice versa, is sure to so weaken the voice that it will require several hours for a healthy throat to recover.

Clearing the Throat.

No healthy singer or speaker clears his throat before using his voice; those who do so are afflicted with a chronic inflammation of the upper air passages. It should be kept in mind that the act of frequently clearing the throat is in itself a cause of debility of the voice.

Tickling in the Throat.

This sensation is due to the presence of diseased secretion that is lodged up behind the soft palate, out of sight, and is apt to increase the desire to clear the throat, but this desire should be resisted.

Cough.

My experience leads me to believe that a cough, at its commencement, is always occasioned by the presence of secretion lodged behind the soft palate,

or an irritation occasioned by inflammation in this region. This is fully three to five inches above the place of the tickling sensation in the throat, and six to eight inches above the location pointed to by the sufferer's finger on his neck. It is evident that if the larynx and vocal cords are healthy, the cough itself would soon occasion irritation and inflammation of the vocal cords, followed by voice disability. This shows the importance of controlling to suppression, if possible, a non-relieving cough.

Gagging Sensations.

The lodgment of secretion on the posterior wall of the pharyngo-nasal cavity occasions a hacking cough, and a cough that is frequently accompanied with "gagging spells." These coughs very soon disable the voice. Sensations that cause these coughs seem to be located in the larynx or even as low as the upper part of the lungs, but the diseased surface that is the cause of the tickling and gagging is located, as I have stated above and behind the soft palate. It will occur to every one that this is a most important matter and should not for a moment be forgotten. It is a waste of time and effort to treat the larynx for this trouble, this part not being diseased, at least not until the cough, by

its mechanical force, occasions disease, which it will do in a short time. The less a sufferer coughs, the better for the throat and vocal cords. The cough will not relieve the tickling sensation in the throat, but will extend the inflammation—the producing cause—further down the air passages. It is evident that all the mixtures that are taken into the stomach to allay coughs of this kind, exert neither more or less effect upon the throat or the diseased surface, than they do upon the feet. That which goes into the stomach—the center of distribution—is as beneficial or injurious to one part of the body as it is to another. The cause of the cough is local, and should receive local treatment, certainly not general treatment alone.

Weariness of the Voice.

This is due to general debility, or to a recent accession of inflammation upon a chronic inflammation of the “vocal region,” the naso-pharynx and pharynx. Very frequently a disordered condition of the stomach appears simultaneously with this weariness. This does not mean that the stomach trouble is the cause of the vocal disability, but is concomitant, the cold which manifested itself in the head also affecting the stomach. Persons who frequently suffer in this way are apt to have perma-

nent vocal debility, especially if they are over forty years of age.

Hoarseness.

Temporary hoarseness is usually the result of a cold, or an excessive use of the voice. In either case the employment of the voice should be discontinued at once. Permanent hoarseness is usually the result of a chronic inflammation of the mucous membrane of the pharyngo-nasal cavity.

Medical treatment should be instituted for both kinds of hoarseness. The longer the delay, the more permanent the congestion and the consequent injurious results.

If the voice is once seriously affected in this way, it will depend on the age and temperament of the patient as to the rapidity of its recovery, and as to whether it will recover at all.

If a cold has been so severe that it produces marked vocal disability, treatment by domestic remedies, or under the direction of any "kind friend" should not be instituted.

Cold Applications Around the Neck.

Very frequently a cold in the throat may be greatly benefited, if not entirely relieved in one night

by placing a wet folded handkerchief over the front half of the neck and covering this with a neck-wrap passed at least two times around the neck, so as to keep in the heat engendered by the cold pack and keep the cold air from the part of the neck covered with wet cloth.

CARE OF THE VOICE.

Colds.

Of course, while suffering from a cold, the voice must not be used in singing or speaking exercises. As soon as convalescence has commenced, then gentle exercise may be beneficial. It may be necessary for the patient to speak in a whisper, or in a very low tone, and to avoid boisterous laughing.

On recovering from a cold, the vocal exercises should be progressive, and in accordance with well known rules by teachers of singing and elocution. I recommend such a course to all of my patients, who have weak chests, that is, whose respiratory expansion was hardly two inches, and they soon observe great improvement in their lung capacity. The improvement that is observed in such cases is the very best recommendation of the method employed by the voice-trainer.

Sometimes a Turkish bath will have an excellent effect on full-fleshed, hearty persons, but two hours at least should be spent in the cooling room, and it would be well to have the back and neck rubbed with a small quantity of vaseline after being dried. The cold douche should not be taken, except by young (under thirty-five years), strong persons.

Out-door singing and speaking should be avoided if possible. Many young men have ruined excellent voices by singing out doors at night. Unconsciously the vocal apparatus is overtaxed, and under these circumstances a serious cold is easily taken.

Dust and Tobacco Smoke.

Do not undertake to sing in a room where a number of persons have just completed a round of dances, as the dust will be sure to do positive harm to the upper air passages. Tobacco smoke, even a small quantity of it, is harmful.

Cars.

Avoid using the voice on board the cars when they are running. More vocal exertion than usual is required to overcome the noise, and the shaking of the body makes it necessary to employ still great-

er exertion to prevent the voice from taking on a tremulous tone, all of which is exhausting to the vocal muscles. An hour's talk in a running car is more wearing to the voice than three hours' conversation in the house; and if one is riding with a passenger who frequently says: "What did you say?" the labor is very greatly increased. I know of a university president who will not take a seat in a car if he sees a man in it whom he knows, for fear that his friend will take a seat at his side and "talk him out of voice."

Opera singers, who are off the stage waiting their time of entrance, should not use their vocal cords, except in a low conversation.

Many singers consider *loudness* a part of the beauty of their song, and strain their cords, thus running the risk of seriously impairing their voices. It is not nearly as dangerous to the voice to speak loudly as it is to sing loudly. While one is singing the vocal cords are in a more or less continuous uniform tension, whereas in loud speaking the cords are only momentarily brought to their greatest tension.

Screaming.

Screaming should not be indulged in by voice-users; it is very injurious to the vocal cords.

Weakness.

If the voice shows any weakness on rehearsing, accept this as a warning to refrain from singing for some time. It should be kept in mind that if the throat become soon fatigued the method of using the voice is erroneous, or there is a chronic inflammation of the nasal and pharyngo-nasal cavity, or the body generally is much debilitated. Under these circumstances one should desist as soon as the opportunity presents itself. A voice that has at one time been pure in tone, but now soon becomes quivering and shaky, and has, at the same time, its former quality veiled, is suffering from some serious impediment which is most likely caused by inflammation of the pharyngo-nasal cavity.

Weariness.

If a singer or speaker, during the use of his voice in a moderate temperature, *perspires* freely, this also indicates that his system is over-taxed in the exercise of his debilitated vocal muscles, or that he is guided by an improper method in the use of his voice.

Encores.

Answers to an encore should not be given by

rendering the same selection a second time, as this exhausts the larynx much more than giving a selection of an entirely different kind. The voice should not be used too long in a continuous strain; a change of tone is a rest to the laryngeal muscles.

THE EARS.

Healthy ears are very essential to voice-users. No person can speak distinctly unless he can hear audible tones distinctly.* The vocalization of every word, whether it is said or sung, is performed by the guidance of the ear; consequently if the hearing is imperfect, every word, whether said or sung, will be imperfectly vocalized.

Imperfect Hearing.

Is occasioned by various abnormal conditions. The accumulation of ear wax in the auditory canal is sometimes so great that the wax presses against the drum membrane and gives rise to most distressing symptoms, as well as to deafness. On these occasions motions of the jaw will aggravate the

*There are a few exceptions to this; some persons whose hardness of hearing outside sounds is due mainly to middle ear troubles. Such persons hear their own voices very loudly, and they speak in a very low tone and very distinctly.

trouble. Very frequently the mass of cerumen is suddenly increased in size by the absorption of water entering the ear while bathing, thus causing the wax to swell to the extent of completely closing the passage against the entrance of sounds from without. This has the effect of suddenly changing the tone of the sufferer's voice in his own ears. Every word, spoken or sung, has a peculiar loudness that both startles and greatly confuses. I have the history of a large number of cases whose deafness was accompanied by these symptoms:

"My hearing has been slowly decreasing for some months past. My wife noticed it before I did. Last Sunday I took a turkish bath. Immediately after I came from the shower I felt the left side of my face and head become slightly numb and observed that every sound was much more indistinct than usual, but my own voice was unusually loud and confusing. My ear pained me when I rubbed or pressed it. I went to my physician, but he did not attempt to do anything for me, but sent me to you."

After a large plug of cerumen had been removed the disagreeable symptoms at once subsided, and his hearing returned to its usual degree of acuteness.

Imperfect hearing is sometimes due to an extension of a naso-mucositic inflammation into the

Eustachian tubes. If the inflammation is of recent date, and is accomplished by a profuse nasal discharge, it is altogether likely that one or both tubes are completely closed by muco-purulent secretion from the pharyngo-nasal cavity, thus preventing the air from entering the middle ear through the Eustachian tubes, an essential to good hearing. This condition occurs most frequently in young persons.

Patulent Eustachian Tubes.

If the subject has had chronic nasal inflammation that has extended into the ear, sometimes an opposite condition of this small passage to the middle ear is brought about, namely, an abnormally open condition of the tube, which I have called patulency of the Eustachian tube. In this latter condition the voice has an opportunity to reach the ear from the pharynx through the Eustachian tube—a much shorter route than is natural—occasioning so much confusion of thought that the sufferer is compelled to desist from speaking, and correct singing is out of the question. It is then impossible to strike one note properly, showing plainly the immense value of the ears to singers and speakers. In these instances the voice sounds double and produces the impression of one speaking in a large vacant room,

or with the head thrust into a large barrel. The sound of the voice as it goes through this unnatural passage to the ear from the throat, is frequently so loud that it is very painful. Rarely are both Eustachian tubes open at the same time.

Double Sound of the Voice.

The prominent symptom of patulency of the Eustachian tube is the peculiarity of the patient's voice to himself. His voice sounds double, one voice dim and distant, the other right in his ear, producing a very disagreeable effect, one that will compel him to stop speaking even in conversation. Sometimes such patients get in the habit of talking with the jaws quite close together, noticing that excessive opening of the mouth aggravates the trouble. Putting a finger in the ear will not stop the voice from going to the ear; it will stop the dull, distant, outside sound, but not the loud, disagreeable, inside sound that goes right into the ear. If such a patient will close both nostrils with his thumb and finger and swallow some saliva, the disagreeable symptoms will frequently leave, as by magic, and may remain away until he swallows with his nostrils open, which usually brings all the symptoms back again.

The Mechanism of a Patulent Eustachian Tube.

The Eustachian tube is a slit-shaped canal. A peculiarity is that there is a capillary opening—for the continuous entrance of air—in the upper portion of this slit. A cross section through this canal resembles a button-hole in a coat, the small round hole in the upper part of the button-hole represents the air-canal of the Eustachian tube. If this air-canal were larger than it is, too much air would enter the middle ear and occasion deafness, but much worse than this, the speaker's own voice would go to his ear from his throat and occasion so much confusion that he could not think and talk at the same time.

Now, this is just what is done by diseased action. The slit-shaped portion of the canal, which is under the air canal, has become so inflamed that mucopurulent secretion is thrown out by its mucous membrane, and this secretion, which is thickish and quite tenacious, holds the sides of the canal so far apart that the air-canal is enlarged to many times its normal capacity, thus allowing the voice to enter the middle ear, as well as allowing by far too much air in the middle ear. This results in marked deafness.

Instead of the canal being held too open by mu-

cus, the mucous membrane on both sides of the canal may be swollen so as to act like a wedge in maintaining the patulence.

Closing the nostrils with the thumb and finger, and swallowing some saliva abstracts air from the middle ear and frequently temporarily restores the usual degree of hearing, as stated above.

Again, imperfect hearing may be due to a chronic inflammatory process slowly thickening the mucous membrane of the Eustachian tubes, thus preventing the entrance of a sufficient quantity of air into the middle ears, or this inflammation may injuriously affect the two small muscles of the middle ear, debilitating them to such an extent that they do not perform their functions, or this inflammation may thicken the mucous membrane, lining them, and thus preventing the free movements of the small bones of the ear, as well as of the drum membrane. Deafness from these causes is very slow in manifesting itself, and is always perfectly painless. This is the most serious kind of deafness; first, because it slowly comes on the victim without his knowing it, and second, because it is most difficult to cure.

Imperfect hearing may be due to noises of various kinds in the ear, resembling the hissing of steam, etc., or the sound of a cricket, etc.

Lastly, imperfect hearing may be due to disease of the auditory nerves of the ear.

Itching of the Ear Canal.

“Is it wrong, if the ear itches, to relieve this sensation with a pin, holding the pin by its point and putting its head into the ear?”

There is very little opportunity to injure the ear in this way, unless the integument lining the auditory passage is in a diseased condition. If the itching is caused by the presence of ear wax, the ear will be benefited by removing the wax with a pin. Even if the ear wax is not the cause of the itching, no harm can come from relief obtained in this way, except as above stated.

Cold Water Injurious to the Ears.

If the auditory passage requires cleansing, do not dip the corner of a towel in cold water and thrust it into the ear. Cold water is very likely to injure the ear and produce a slight itching sensation. Everything applied to the auditory passage should be warm. Washing these passages with warm water is not harmful.

Ear Muffs.

All patients who have suffered a perforation of the drum membrane should protect the ear against

cold winds by wearing an ear muff or something equally protective. A few minutes' exposure to a cold, damp wind, will almost certainly increase a chronic otorrhoea, and the consequent further decrease of the hearing, if it does not occasion so severe an inflammation as to impair health.

Some sort of covering should be worn by every person in very cold weather to protect the ears from the cold and damp winds.

The Tongue.

No one who has used tobacco for fifteen years, and is continuing to use it, has a healthy tongue. All malignant diseases of the tongue are preceded by long-continued inflammation. A healthy tongue is never attacked by a cancerous growth. Nothing that is usually put into the mouth can produce a more lasting congestion than tobacco. Tobacco cannot produce cancer, but it does always produce inflammation, and this may terminate in cancer. Nine-tenths of the cases of cancer of the tongue, in men, come from inflammation started and maintained by tobacco.

In a very great majority of instances, if the use of this narcotic were discontinued, the tongue would, in a few months, so far recover its normal condition that no disagreeable sensation would be experienced under any circumstances. A small

percentage of those who suffer from the effects of fissures of the tongue will require special local and constitutional treatment.

Of course, if the tongue is much affected, speaking or singing will be more or less defective, as this organ has much to do with the formation of many sounds in both speech and song.

Some persons are in the habit of scraping the tongue when it is coated. This is quite injurious, and does not remove the offending secretion nearly as completely as gargling the mouth with quite warm water. Neither the scraping nor the gargling will remove the cause of the deposit; this can be accomplished only by proper attention to the system generally, and many times by attention to the stomach alone.

The Lips.

It is seldom that the lips are diseased. They sometimes become chapped from excessive heat or cold, but more often this condition indicates a disordered condition of the stomach. For mild cases the application of a little vaseline or mutton suet or glycerine will give the desired relief. If a chapped sore on the lip has remained unhealed for a year or more, a physician should be consulted, as this may be the commencement of a cancer.

The Teeth and Gums.

Many years of experience and observation warrant me in asserting that the presence of decayed teeth and diseased gums will maintain a chronic inflammation of the mucous membrane of the nasal and pharyngo-nasal cavities, the throat and ears, and will ultimately affect the voice. It is frequently the case that the inflamed condition of these organs can be only ameliorated while the gums remain diseased or decayed teeth remain in the mouth.

A few illustrative cases will demonstrate the correctness of the views here given :

Miss G. W., aet. 22 years, a singer in a church choir, was treated in March, 1876, for naso-pharyngeal disease and for impairment of her voice. On the first visit I noticed that her teeth were in bad condition and advised that she secure the services of a dentist. She promised to do so, but from the fear of the pain that the dentist would give her, she deferred attending to the matter. The treatment relieved the nasal trouble, but the inflammation of the vocal cords was but slightly ameliorated. Becoming discouraged at the ill success attending the treatment, she left me and secured the services of another physician, who treated her for several months with the same results. In the spring of 1877 she again visited me for treatment. I again insisted that she procure the services of a dentist. She complied, and the treatment that was given and continued for six weeks gave results that were quite satisfactory.

Mr. ———, minister, æt. 52 years, in May, 1877, required treatment for hoarseness. During his visits he mentioned, casually, the fact that if any food became impacted between the first and second molar teeth of the lower jaw, he felt impelled to clear his throat by hawking. On one occasion a small piece of fish-bone became fastened between these teeth. He made frequent unsuccessful efforts at its removal, which resulted in rendering him completely aphonic for two days. The removal of the bone relieved him of the throat trouble entirely and in a few days, with but few treatments, his voice returned.

Of course, these are exceptionally marked cases, but they demonstrate the intimate relationship of the teeth to the adjacent organs.

The Absence of Teeth.

If a few of the upper teeth are absent, this will interfere with the purity of the voice in both singing and speaking. All the absent ones should be replaced by artificial teeth.

The Lungs.

Phonation is the result of compressed air passing through the glottis, causing the vocal cords to vibrate. The compressed air comes from the lungs, consequently, if these organs are capacious, the quantity of air will be great and the sound from the larynx proportionately long continued and voluminous. This being the case, voice-users should

be anxious to increase the capacity and strength of their lungs.

Bronchitis.

Lungs that are affected with this disease cannot perform good service in singing or speaking. There are many persons who have a persistent cough who do not have bronchitis, although such a cough is usually said to be due to an inflammation of the bronchial tubes. Many coughs are nasal in origin. This should be remembered.

Asthma.

Singers and speakers who have the least tendency to this disease, should get rid of it as soon as possible. They do not know the moment when they will have an attack, which will at once totally disable them. Those who have had even slight attacks of asthma are more liable to it thereafter.

The Diaphragm.

This organ is one of the accessories to the vocal apparatus; therefore its normal action should not be impeded. With men, its functions are nearly always up to the normal standard; not so with women, as a rule. They employ the only means that could be devised to impede its full action.

"The whole civilized world is in bondage to a pernicious habit of dress—practiced by its women and countenanced by its men—that threatens the abrogation of the diaphragm."*

To develop the full power of the vocal cords, either in speaking or singing, every accessory to these air compressing organs must be maintained in the best possible condition, and as the diaphragm should do fully two-thirds of the inspiratory labor, all constriction should be removed from the waist. It is evident that without full, free and easy inspiration, the result of expiration—the voice—**must** be injuriously modified.

Then again, motion is an essential to perfect digestion of the food in the stomach and the healthy action of the bowels, and this motion is, to a great degree, imparted to them by the diaphragm, if it is not impeded by a form of dress—the corset—that prevents the expansion of the lower portion of the lungs.

Corsets.**

If capacious lungs are desirable, then everything that prevents these bellows from swelling to their utmost should be removed. This means that cor-

*Kitchen, on the Diaphragm, page 6.

**See Glossary.

sets should not be worn by those who wish to have capacious lungs. Wearing these girdling machines is another evidence of woman's weakness of character. Men show their good sense, their determination to be comfortable, by not being "cramped" by corsets, but women, and especially the most beautiful of them, are slaves, abject slaves, to **lung clamps**. They fancy that they are more attractive if their waists are small, when the contrary is the effect in the eyes of every student of nature. A pretty face over a small waist is bearable, but a homely face is made less attractive by squeezing that portion of the body between her shoulders and hips so as to resemble a wasp, and the smaller the waist the worse the effect on the general appearance. Every well-educated man knows where a small-waisted woman's lungs, liver and stomach, etc., are pressed to. No sculptor would select such a warped or rather deformed specimen of humanity as a model. Many women think their waists are naturally small. No doubt, the waist of a woman is smaller than the waist of a man; this being the case, there is less reason for wearing corsets. The majority of women's waists have been locked in cramping machines since they were girls; consequently, their ribs have had no opportunity to take their proper and natural places. I do not think I

ever saw a woman who admitted that she wore her corsets tight. The following are some of their expressions concerning this matter :

"I can turn around inside of my corsets." "I can draw my corsets two inches tighter and not feel them tight." "I could put a marble in the bosom of my dress and have it pass my waist," etc. Even if all this be true (and it is not questioned), it does not in the least alter what has been said about the harmfulness of wearing corsets.

I have had quite a number of young ladies leave off their corsets—on a trial—from three to six months at a time. With few exceptions, they have not again put them on; several made the trial of again wearing them to an evening party, but were anxious to get home to take them off, not to be again worn under any circumstances. I am satisfied that if those who have been accustomed to wearing corsets will take them off for one year, they will not again resort to this very unhealthy mode of appearing attractive, *this being their only use.* I know that many will say, "O, I feel so uncomfortable without my corsets that I am sure they do not hurt me at least." This is just what a Chinese woman would say regarding the removal of her small, cramping shoes. The corseted American is as nearly right in this respect as the "Heathen Chinese."

The Respirator.

Avoid being in the dust, or out of doors in the night air, especially if the weather is cold and damp, or foggy. If compelled to go out in such weather, cover the mouth with a thin silk handkerchief. This, in my opinion, is by far the best respirator I have ever seen. I recommend it to every person requiring the protection of a respirator during our coldest days in winter.

Protection of the Throat, and Relief of Disagreeable Throat Symptoms.

The answers to the following three questions are important to professional voice-users :

First. Is it necessary for singers and speakers to protect their throats while going to the place where they are to sing or speak, and if so, how shall they do it?

Second. Should they use a gargle or a local tonic before singing or speaking, in case their throats "do not feel quite right?"

Third. What course should be pursued after singing or speaking, and while on the way home?

These questions will be answered *seriatim*.

Protecting the Throat Before Singing and Speaking.

The answer to the first question is dictated by

common sense, namely: Protect the throat if the weather is such that if it is not protected the singer or speaker is liable to take cold. A loosely knit woolen neck comforter is the best wrap for such purpose. It should not cause the least perspiration or over-heating. One should be particular on this point, as an over-heating of the neck might prove a greater detriment to the mucous membrane of the air passage than the absence of a neck-wrap.

A small quantity of vaseline rubbed on the neck just after washing, will prove a valuable protector against colds. Many persons fear that after the vaseline is applied to the neck, the skin will have a greasy appearance; this need not be the case, as the quantity required is so very small that no one can see that any has been placed on the surface.

Gargles, Etc.

The answer to the **second** question is that no healthy throat requires any local tonic, as such a throat is never dry, nor does it feel "just a little out of sorts."

While this is the case with the healthy throat, a throat that is not quite healthy may be temporarily relieved by various agents, but these agents must not have the least weakening tendency while they are giving the singer or speaker a little relief. Such

injuriously compounds as "Brown's Bronchial Troches," etc., composed, among other things, of cubebs, camphor, chlorate of potash, cocaine or morphine, are sure to produce congestion of the mucous membrane of the fauces and larynx. Eschew everything that has camphor or cubebs or chlorate of potash or cocaine in it. Their effects are almost always injurious.

Muriate of Ammonia.

The only agent that I would recommend is a small tablet made of compressed purified muriate of ammonia. This will frequently assist in causing a pleasant flow of faucial secretion, which sometimes relieves a dry sensation in the throat. If the sensation of dryness is continuous, a physician ought to be consulted.

Drinking Water While Speaking.

It is best not to get in the habit of taking water while speaking. If the speaker feels as though he must moisten his mouth, a teaspoonful of water is just as relieving as a half a glass full.

Throat "Comforts(?)"

The following is taken from Davis: "On the Voice," and is given to show the peculiarities of some singers in their attempt to give a finishing touch to improve the quality of the voice:

With many who follow the stage, but little judgment is exercised in the selection of "throat helps (?)" as the following quotation proved :

"Southeim takes a pinch of snuff and a glass of lemonade between acts.

"Niemann sips champagne.

"Tichatcheck washes his throat with mulled claret.

"Ferenczy, the tenor, smokes a few cigars.

"Braun Brini drinks a glass of beer at the conclusion of the first act ; after the second eats a little moistened bread ; after the third and fourth acts drinks *café au lait* ; and when she is going to sing the great duet in the fourth act of 'Huguenots,' as goddess of the art of song, she demands a bottle of Moët Rose as a libation.

"Cruvelli takes a mixture of claret and champagne.

"Nielson takes a glass of beer.

"Madam Borghi Mamo is lost without a pinch of snuff.

"Malibran used to take supper in her box about half an hour before coming on the stage. She ate mutton cutlets in the costume of Desdemona, and almost invariably washed them down with a half bottle of Sauterne. This was generally followed by smoking a cigarette, which was only tossed aside just before her appearance on the

stage. Sometimes she drank porter, which she drank out of the pewter.

"Grisi, during the last act, drank a bottle of Dublin stout.

"Rubini drank a bottle of claret.

"Duprez takes a pint of champagne."

These "fancies" are not recommended. The opinion of most educated voice-users that I have met is that those who employed them could sing and speak well in spite of the bad effect of those "congesting" agencies.

The courses pursued by the following singers and speakers are recommended:

Labatt, the Swedish tenor, is in the habit of eating a couple of salted cucumbers before appearing on the stage. He looks upon this as a strengthening remedy for the voice.

Wachtel, the tenor, takes an egg beaten up with a little sugar. He considers that this softens the voice, and it is, no doubt, very good.

Madam Sontag used to take sardines between acts.

Madam Desparée soothes her throat with plain warm water.

Madam Cabel eats pears.

Adelina Patti prefers a bottle of Seltzer water.

Ngaldi has a preference for plums.

Trevelli Bettini eats strawberries, when they can be had.

Mr. Sims Reeves recommends a glycerine lozenge.

The following is the experience of an old amateur of New York city: "It appears rational to avoid anything before singing that would tend to irritate the throat.

"Some singers take an egg (the yolk) beaten up with powdered sugar—others advocate the eating of French prunes."

Protecting the Throat After Singing and Speaking.

The third question, as to the course to be pursued immediately after exercising the voice and while on the way home, is a very important one.

Protection.

Singers and speakers should not for a moment forget that after they have exercised their vocal cords, these organs are in a partially debilitated condition, and therefore more liable to be injuriously affected by even slight exposure to cold. This plainly indicates that extra protection should be placed around the neck, but great care should be taken not to place so much covering there that even a very slight perspiration will be induced.

The throat should have no more protection than is needed to ward off the injurious effects of cold, as excessive covering would maintain the blood in the larynx, just what is not desired. If the atmosphere is even cool or damp, the mouth must be kept closed, and answers to questions should be given through the nose with the mouth shut, in the usual double monotones, for yes or no.

Temperature of the Stage.

Many good voices have been ruined by singing and speaking on a cold stage. An over-heated stage is nearly as injurious.

It is preferable that the temperature of the stage should be pleasantly cool rather than pleasantly warm. A pleasantly cool temperature in a room where one is walking and exercising his vocal powers, is about 65 degrees to 70 degrees F.; whereas a pleasantly warm temperature is in the neighborhood of 85 degrees F. On a stage of the latter temperature, overheating is very apt to occur, whereas with a pleasantly cool stage this is far less likely. Every singer and speaker whose throat is weak, should remember that an overheating almost always results in a cold.

Domestic Remedies.

There are but a few remedies a sufferer can apply to his painful tonsils that will give relief. Garg-

ling the throat with hot milk and water, equal parts of each, with enough cayenne pepper in the mixture to produce a pleasant, warm sensation, is frequently relieving; taking a small quantity of vaseline in the mouth, and allowing it to flow over the inflamed tonsil, is beneficial; but these remedies will not relieve a severe case; for such a physician should at once be called. Washing the mouth and throat with cold water, with a little salt in it, after cleaning the teeth, early in the morning and late at night is beneficial. Gargles of strong astringents, or of chlorate of potash, should not be used; they always do harm. **Chlorate of potash is especially harmful** when the throat is sore. No domestic remedy is universally good for all kinds of throat disabilities. Many vocal teachers prescribe compounds of which they know but little of the effect, except on themselves. No two cases are alike. What may be beneficial to one may be quite injurious to another.

Diet.

Voice-users should carefully avoid every article of diet that disagrees with them. As a general thing, pie, cake, nuts, salt meat and highly seasoned food of any kind should be avoided. The voice will be at its best if the stomach is not too full or too empty. The meal taken before appearing on

the stage should be as fluid as possible to be strengthening. Beef-soup or beef-tea is excellent, because it furnishes the strength without requiring great activity of the stomach.

The Effect of Tobacco on the Mucous Membrane.

The use of tobacco is so very common by singers and speakers that a few remarks upon this subject are called for. It should go without urging, that whatever produces congestion of the mucous membrane of the vocal organs in the nasal passages, mouth and throat produces debility, and that which produces debility of these very important organs weakens the voice. When this is well known, why should voice users knowingly debilitate their vocal organs by the use of tobacco?

The congestion of the mucous membrane of the nose and throat occasioned by the action of tobacco, resembles, in many respects, the congestion resulting from the effect of a cold, and like the effects of a cold, some are transitory and some permanent.

Some of the transitory effects are the excessive depression and nausea of the novice; after toleration has been established, come the transitory effects of trembling hands, of head-ache, of heart-burn, or hiccough, of perverted taste, of dyspepsia,

of dizziness, of constipation, of palpitation of the heart, of dry throat and nostrils, of sore tongue, cheeks and lips, of offensive breath, etc.

The permanent effects consist of the local relaxation and congestion of the mucous membrane of the superior portion of the respiratory tract, and of the results following and originating in this relaxation and congestion *per se*.

The congestion arising from the effects of tobacco, and the congestion resulting from continuous colds is very much alike. A woman of ordinary health who has had frequent colds from her girlhood to her fortieth year, and a consumer of tobacco of ordinary health, who, from his fifteenth to his fiftieth year, has used this narcotic moderately, both have equally pronounced nasal and pharyngo-nasal inflammation, that is, if both are of the same temperament. If the woman has black hair and the tobacco victim light hair, his nasal passages will be in a much more inflamed condition than hers, and *vice versa*. If a light-haired boy begins at the age of fifteen to use tobacco inordinately and continues to use it excessively for twenty years, the resulting congestion will be so severe as to ultimately involve other important organs; the eyes, brain, stomach, heart, and the lungs are liable to be implicated to such an extent that life will be shortened

many years, and after death, mortification will begin first in the nasal passages.

From daily observations, made for a period of over thirty-five years, I have come to the conclusion that the local effects of tobacco on the mucous membrane causes a more permanent relaxation and congestion than any known agent.

My attention was directed to the relaxing and congesting influence of tobacco while I had charge of a ward in the U. S. General Hospital at Jefferson Barracks, Missouri, in 1862. I was at that time treating a patient for nasal and aural disease; he smoked and chewed tobacco excessively. He frequently said that he feared that he was injuring himself by its use, but the habit had such a strong hold on him that he made no effort to discontinue it, nor did I at the time think he was injuring himself to the extent that I now know he was. At that time I was using tobacco myself, and consequently did not think it very harmful. A physician who uses tobacco or whisky does not discourage the use of either in very strong terms, not because this would be a plain condemnation of his own habit, but **because he is actually ignorant of the whole harm that these agents inflict.** This patient was under my care for about three months, and died. I made a very careful post-mortem examination of the nasal and pharyngo-nasal cavities,

and found the mucous membranes in an exceedingly congested condition. It was oedematous and of a black-brown color, showing that mortification had begun at this locality some time before death. At the same time I made two other post-mortem examinations. In one, the mucous membrane of the nasal passage was nearly of a normal color. In the other, the nasal passages were of a dark red, but not of so deep a dark color as were those of my patient. On the same day I chanced to meet the physician who had the professional care of the last individual examined. I spoke to him about the peculiarities revealed by the post-mortem examination, he stated that his patient also was a habitual smoker. I soon learned from the other physician and a nurse that the other individual, whose nasal passages were found in a comparatively normal condition, had never been addicted to the use of tobacco in any form.

Smokers Can be Selected After Death.

For the purpose of investigating this and other allied subjects, I made, during the succeeding three years, not less than twenty post-mortem examinations of a similar nature, and, judging from the state of the nasal passages, I successfully selected, in every instance, the bodies of those, who, during

life, had been habitual smokers. Their mucous membranes were always of a darker color than those of non-smokers, and where tobacco has been used excessively and for a number of years, there was always evidence of mortification before death.

During the past twenty-five years, my opportunities for making post-mortem examinations have been exceedingly limited, but in each instance the mucous membrane of the smoker was observed to be much darker in color than that of one who did not smoke tobacco.*

*The reader is referred to "The Mental and Physical Effects of Tobacco," by the Author.

GLOSSARY.

ABNORMAL. A diseased condition, not normal.

ADAM'S APPLE. The projecting portion of the neck, to the inside of which are attached the vocal chords. In swallowing, this projecting point moves upward.

ADENOID GROWTHS. Enlarged growths on glands, most frequently seen in the young, up behind the soft palate.

APONUROSIS. A fibrous membrane.

APHONIA. Loss of voice.

ARYTENOID PROCESSES. Two processes to which the phonal (vocal) cords are attached, and which tighten these chords when phonation is performed.

AZYGOS PROMINENCE. A ridge running up the center of the back or posterior portion of the soft palate, seen in Fig. 2, page 30, Az. Pr. An organ required in singing, elocution and mimicking.

BOLUS. The mass of food in the mouth.

BRONCHITIS, Inflammation of the large air passages of the lungs.

CADAVER. A human corpse, as a subject for dissection.

CARTILAGENOUS. Gristly.

CATARRH. Flowing down or running down; a very imperfect name for nasal inflammation, naso-mucositis, rhinitis, endorhinitis.

CERUMEN. Ear wax.

CORSETS. Lung clamp; an evidence that the wearer cares more for appearance than for health.

DEGLUTITION. Swallowing.

DIAPHRAGM. A thin muscular and tendinous partition separating the lungs from the stomach and bowels, commonly called the midriff.

DORSUM OF THE TONGUE. Upper and back portion of the tongue.

ELEVATOR PALATI MUSCLES. Two small, long muscles for lifting the soft palate.

ELEVATOR UVULAE MUSCLES. Two small muscles to draw the uvula upward.

EPIGLOTTIS. A cartilagenous organ located at the root of the tongue. During respiration it is upright or nearly so. During deglutition, the larynx is brought up so high that the epiglottis is made to cover the opening into the lungs; this opening is called the glottis. It is seen in Figs. 1, 2, 4 and 5, Ep., pages 29, 30, 36, 37.

EUSTACHIAN TUBE. The canal connecting the pharyngo-nasal cavity with the middle ear. The mouth of the tube is seen in Figs. 1, 4 and 5, pages 29, 36, 37.

EXPIRATORY MUSCLES. Muscles that expel the breath; the abdominal and some of the chest muscles.

FAUCES. The back portion of the mouth; seen when the mouth is wide open, and the tongue depressed. By referring to Fig. 3, page 34, it will be seen that the reflector, R, is in the fauces.

FIBROID GROWTHS. Very firm tumors.

FOLLICULAR PHARYNGITIS. A roughened, diseased condition of the back part of the fauces or throat, as seen when the mouth is opened wide.

FRONTAL SINUSES. Air cells that connect with the nasal passages. The eye brows cover them.

GAGGING SPELLS. Exceedingly disagreeable sensations occasioned by secretion lodged on the posterior wall of pharyngo-nasal cavity, behind the soft palate; the difficulty of dislodging it causes one to be sick at the stomach. It always is a consequence of long standing nasal inflammation.

GLOTTIS. The space between the phonal (vocal) cords.

HARD PALATE. The roof of the mouth. By placing the finger on the roof of the mouth, the hard portion that is felt is the hard palate, while further back it will be found to be soft; this is the soft palate. The hard palate is seen in Figs. 4 and 5, pages 36 and 37.

HYPERPLASTIC. An enlargement of a part, abnormal over-growths as of a uvula, or turbinate process, or the growths on the tonsils, etc.

- HYPERTROPHY.** Enlargement; normal over-growths.
- IDIOPATHIC.** Applied to a morbid condition which arises primarily, and not in consequence of some other disease or injury.
- INSPIRATORY MUSCLES.** The muscles that draw in the breath, the diaphragm and muscles of the chest.
- LARYNGITIS.** Inflammation of the larynx.
- MASTICATION.** The chewing of food.
- MECHANISM.** The physical formation of the diseased part, the changes that disease produces in a part.
- MENINGES.** Covering membranes of the brain.
- MIDDLE EAR.** The cavity interior to the drum membrane.
- MUCOUS MEMBRANE.** The lining membrane of the mouth, nostrils, ears, lungs, stomach and all air passages and digestive canal, etc., of the body.
- MUCUS.** The fluid that moistens the lining membrane of the mouth, nasal passages, etc.
- NASO MUCOSITIC.** Inflammation of the nasal mucous membrane.
- NASO MUCOSITIS.** *Naso*, pertaining to the nasal passages; *Mucositis* inflammation of the mucous membrane; *naso-mucositis*, inflammation of the nasal mucous membrane.
- NASOPHARYNGITIS.** Inflammation of the mucous membrane lining the naso-pharynx, or pharyngo-nasal cavity.
- NASAL TURBINATES.** Turbinate processes, three convoluted projections in each nasal passage.
- NORMAL.** That which is healthy.
- OBJECTIVE SYMPTOMS.** Signs, or objects or conditions seen by any one making an examination; for instance, yellow matter seen in the throat, etc., is an objective symptom of mucositic disease of the pharyngo-nasal and nasal cavities.
- OTOMYASTHENIA.** Debility of the two small muscles in the middle ear.
- PARESIS.** Debilitated, partially paralyzed.

PATULENCY. An abnormally open condition of some canal.

PHARYNGO-NASAL CAVITY. Sometimes called the Naso-pharynx. The cavity behind the soft palate, and the back portion of the nose; the nostrils open into it. By reference to figure 1, page 29, it will be seen that the reflector R., and the mouth of the Eustachiau tube is in this cavity. The dotted line is its anterior boundary; the joint of the reflector is touching its upper boundary, and the uvula, U., is at the lower boundary.

PHARYNX. The posterior wall of the throat, it is seen when the mouth is wide open and the tongue depressed.

PHONAL. From the Greek "phone," a sound, a tone; a sound of the voice of man, brute or insect; and one of the primary elements of utterance.

PHONATION. Making sound. Making tone; from Greek "*Phone*," sound, or tone.

PHONAL CORDS. Horizontal bands in the larynx, that, when thrown into vibration by the air from the lungs, produce sound. Their healthy color is the same as the white of the eye. Seen, imperfectly, below the letters Ep. in Fig. 1, page 29. Commonly called vocal cords.

PHONAL VIBRANT or cords, or bands, commonly called vocal cords. Vibrant, from Sanskreet, "*vip*," tremble, as a vibrant string.

POST NASAL. The back portion of the nasal cavities.

POSTERIOR NARES. The openings into the posterior nasal passages, they are located above the soft palate, and seen only by reflection.

PRURITIC RHINITIS. Itching inflammation of the nose. Hay fever, rose fever, pollen fever, etc.

RESPIRATION. The act of drawing in the breath and expelling it.

RESPIRATOR. A covering for the nostrils and mouth.

RESPIRATORY TRACT. The air passage from the anterior nares into and including the lungs.

SOFT PALATE. The hanging portion of the palate seen in the upper and back portion of the mouth. The

uvula is a small organ attached to it, and is seen hanging down from the middle of the soft palate. This small organ is erroneously called the palate. S. P. Fig. 1, page 29, represents the soft palate divided antero-posteriorly through the middle; also seen in Figs. 4 and 5, pages 36 and 37.

TONSIL-GROWTHS. Commonly called enlarged tonsils.

TONSILLOID. A growth of the tonsil.

TURBINATE PROCESSES. Three convolutions of bone and mucous membrane on the outside of each nasal passage. The swelling of these projections causes stoppage of the breath through the nostrils. Seen in Figures 3 and 4, page 34, 36. They are not marked in this illustration

UVULA. A small organ attached to the lower edge of the soft palate. Erroneously called the palate. By referring to Fig. 1, page 29, this organ can be seen hanging in its natural position from the soft palate, S. P., also seen at U., Fig. 2., page 30, resting on the base of the tongue, T. In Fig. 3, page 34 it is seen hanging from the soft palate, above the reflector, R. as well as seen by reflection in the mirror itself; also in Fig. 4, page 36, doubled up and resting on the tongue, its natural position when the mouth is not open.

VELUM. The soft palate.

VOCAL CORDS. Properly called phonal cords or bands, so called because most people think that the phonal cords produce voice of speech. These cords are usually called vocal cords; but these cords only make sound, the organs that make speech are above them, in the mouth and nasal cavities.

VOCAL ORGANS. The tongue, the hard palate, the lips, the teeth, the soft palate, the uvula, the azygos prominence, the nasal passages and their connecting cavities. The vocal cords (properly phonal cords) are usually called vocal organs.

VOICE. From Sansket *vachas*, speech. Modifications of the sound that comes from the phonal bands. These modifications are made by the tongue, lips, teeth, hard palate, soft palate, uvula, azygos prominence and the nasal and accessory cavities.

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 Weariness of the voice, 73, 78.

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The hygiene of the voice, with 1898

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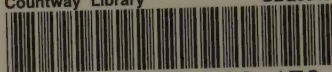
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